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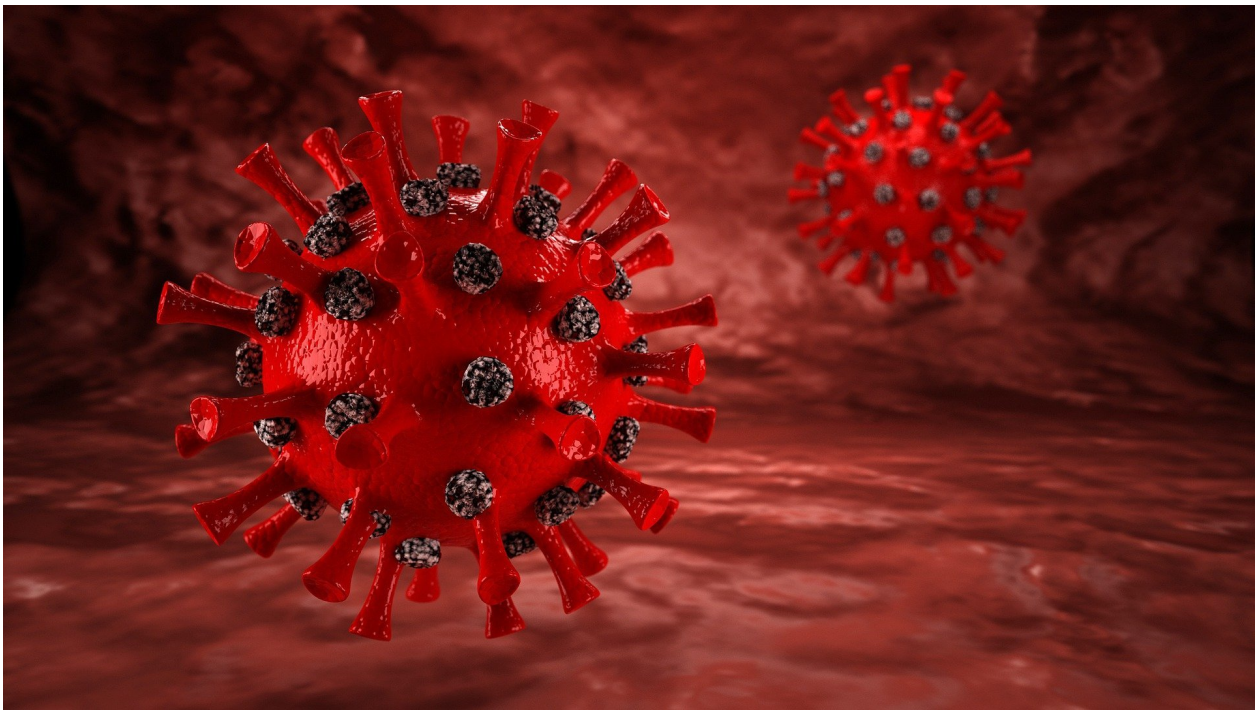

Interview with Holger Karas

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What is Covid?

COVID-19 is a new disease, caused by a novel (or new) coronavirus that has not previously been seen in humans. Because it is a new virus, scientists are learning more each day. Although most people who have COVID-19 have mild symptoms, COVID-19 can also cause severe illness and even death. Some groups, including older adults and people who have certain underlying medical conditions, are at increased risk of severe illness.

On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak, first identified in Wuhan China. The new name of this disease is coronavirus disease 2019, abbreviated as COVID-19. In COVID-19, "CO" stands for corona, "VI" for virus, and "D" for disease. Formerly, this disease was referred to as "2019 novel coronavirus" or "2019-nCoV."

There are many types of human coronaviruses, including some that commonly cause mild upper-respiratory tract illnesses. COVID-19 is a new disease, caused by a novel (or new) coronavirus that has not previously been seen in humans, it was named **severe acute respiratory syndrome coronavirus 2** or short SARS CoV 2*(source: CDC).*

How does it function, change and evolve?

*„A virus is a submicroscopic infectious agent that replicates only inside the living cells of an organism"*or in other words, without a host a virus can not do anything. There are thousands of viruses that can infect other organisms, including bacteria, they are often fairly specific about their hosts.

The current pandemic is caused by a corona virus, named after his specific crown like appearance is known to be able to infect a variety of species, in humans they cause respiratory tract infections that can range from mild to lethal, one mild example is the common cold (also caused by other viruses).

The function of SARS CoV 2 is actually fairly simple, they represent a capsule which protects the genomic information of the virus as RNA (single stranded). The capsule is made of a lipid bilayer (basically fat, that is why soap can help destroy the virus). Outside on the capsule are proteins that can identify a specific part of human cells, dock and penetrate the cell (so called Spike Protein). After entering a cell, the genetic material is unpacked, and the cell starts to produce new viruses and ultimately die. Those new viruses then spread the infection.

During the reproduction of the virus in the cell, the genetic material is multiplied, and errors happen, this is what we call mutation. We actually expected a much lower mutation rate since the virus possesses a proof-reading protein for error correction, which was a mistake. Some of these mutations might be beneficial for the purpose of the virus, which is reproduction and therefore introduce improvements. Many mutations do not have any change of function and some other might render the virus incapable of propagation. Usually, mutations that are beneficial propagate themselves and spread, if additional hots get infected. In case of B1.1.7 or the so-called British variant, the virus gains infectiousness and therefore spreads faster which is of course beneficial for the virus.

From a point of view of evolution, viruses want to replicate and spread, killing the host is basically an unwanted side effect. The selection pressure would actually make the virus less lethal, because that would ensure longer time for replication. Also the ease of infecting a new host is a positive trait and in case of immunity through previous infection or vaccination, evading the immune system is desirable for a virus.

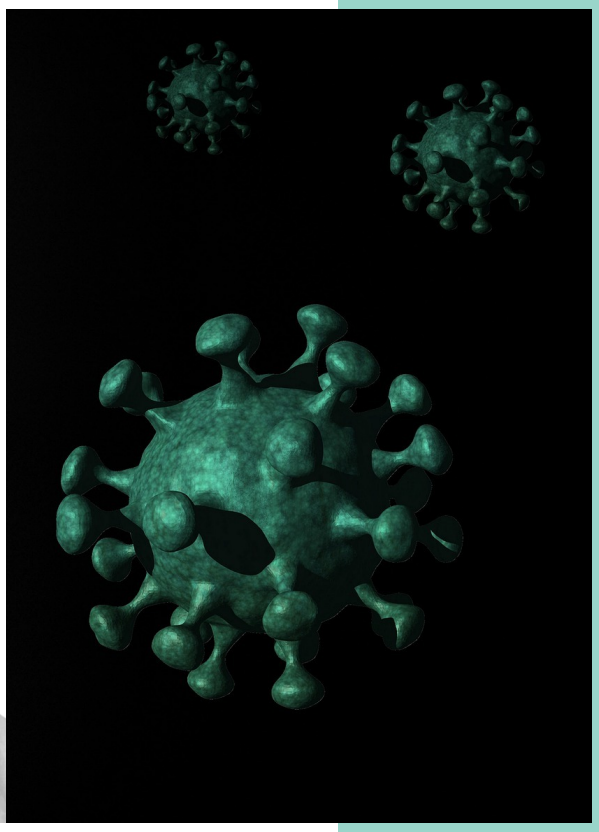
How complex is this virus?

With 29.000 bases the virus genome is actually on the larger size (Ebola: 19.000, Zika: 10.000, Influenza: 14.000). It codes for approximately 29 proteins.

What about it's new variations?

There are two mechanisms which cause slight variations of the viral genome and therefor generate altered properties: mutation and in some cases also recombination. If there are two different strains of the virus present, they can exchange larger pieces of genomic information. This can be specifically nasty here, as there are corona viruses in many different species and the virus can actually do human to animal and animal to human infections, which might impact the formation of more dangerous strains. There was for example a zoonotic transfer to minks and also cats seem to contract the virus, but do not get sick. The main danger of these mutations is the fast spreading and the potential of evading the immune system. In general, before the pandemic ends, the pressure for the virus to mutate might even increase due to more people gaining imunity.

Do the masks work?



In short: absolutely yes, especially if worn properly and by everyone. Since the virus is transmitted within aerosol particles the spread of these particles is reduced. The efficiency is: simple cloth < surgical masks < N95 (FFP2). Face shields are much less efficient. Still distancing is important. There are several studies, that come to the same conclusion, literally: If you receive surgery you want your surgeon wearing a mask, guess why.

“These observations directly demonstrate that wearing of surgical masks or KN95 respirators, even without fit-testing, substantially reduce the number of particles emitted from breathing, talking, and coughing. While the efficacy of cloth and paper masks is not as clear and confounded by shedding of mask fibers, the observations indicate it is likely that they provide some reductions in emitted expiratory particles, in particular the larger particles (> 0.5 μm). We have not directly measured virus emission; nonetheless, our results strongly imply that mask wearing will reduce emission of virus-laden aerosols and droplets associated with expiratory activities, unless appreciable shedding of viable viruses on mask fibers occurs. The majority of the particles emitted were in the aerosol range (< 5 μm). As inertial impaction should increase as particle size increases, it seems likely that the emission reductions observed here provide a lower bound for the reduction of particles in the droplet range (> 5 μm). Our observations are consistent with suggestions that mask wearing can help in mitigating pandemics associated with respiratory disease.

¨Since the virus is transmitted within aerosol particles the spread of these particles is reduced.¨

Our results highlight the importance of regular changing of disposable masks and washing of homemade masks, and suggests that special care must be taken when removing and cleaning the masks."

Source:

https://www.nature.com/articles/s41598-020-72798-7

Asadi, S., Cappa, C.D., Barreda, S. et al. Efficacy of masks and face coverings in controlling outward aerosol particle emission from expiratory activities.

*SciRep**10,**15665(2020).*

https://doi.org/10.1038/s41598-020-72798-7

In addition to wearing a mask, social distancing, avoiding crowds and wash your hands regulary is also mandatory to protect yourself.

Let's say, you are diagnosed positive. Then comes quarantine and after, is it over? Could you explained what happens once you get it? Please give the soft, medium and worse scenarios.

If tested positive strict quarantine is mandatory to stop further spreading, any person in a quarantined household should be of course tested as well. Before quarantine is ended, tests are in my opinion mandatory to ensure, that the viral load is gone and there is no risk anymore for the community.

What actually happens after infection depends on many factors: the general health conditions, other medical conditions or sometimes also bad luck. What I definitely recommend is a quarantine diary where you record your temperature and any other symptoms at least three times a day and stay in contact with a doctor. If symptoms are getting bad, hospital is mandatory.

The CDC has a decent documentation about pre conditions and thing that are important:

https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html

What would you suggest to do once you are positive? Is there a protocol you would suggest such as: lots of vitamins, open windows, breath techniques, sport routine or ginger tea, aspirin, etc. What can a person do to support the body and battle against Covid. Once you survive it what comes next?

As mentioned above it depends on many factors and for supporting your body and therefore the immune system there is no magical substance but a generally healthy lifestyle and most of all avoiding stress is advised. If you feel that for example ginger tea makes you feel good than drink it. Opening windows, stay active and avoid alcohol and tobacco is always good advice, but in my opinion carefully monitoring yourself is important so in case of a severe case, you can seek medical help early enough. “once you survived” implies already a negative state, unless you are very old or have serious preconditions there is no doubt, that you survive, it might suck but most persons will go throu. Important here is to break quarantine only, after it is sure, that the viral load is down. Possible other things are to get an antibody test, if available to insure immunity and do some tests to ensure no permanent damage, which can occur.

Also, as long as the pandemic is there, continue wearing a mask, be careful and aware as immunity might be limited in time and also limited against new variants of the virus. It is better to be careful than getting sick again.

What works better a harsh lockdown like the Australian one or a more soft approach like in Germany? Is a vaccine the final solution?

This is a good question and there is a lot data missing for a definite answer. But here are some thoughts: when the virus started to spread, a 100% lockdown, basically confining whole regions into a full quarantine could have prevented the pandemic in its full scale. With what we know this was China's strategy and it seemed to be successful for China. But the price would be very high and those who would suffer most would be people that would be underprivileged anyway. The WHO stated:

However, these measures can have a profound negative impact on individuals, communities, and societies by bringing social and economic life to a near stop. Such measures disproportionately affect disadvantaged groups, including people in poverty, migrants, internally displaced people and refugees, who most often live in overcrowded and under resourced settings, and depend on daily labour for subsistence.

As for Germany, our society has in my opinion totally failed, people do not feel responsible for other people really. Politics and to a certain extend science have also failed as they did not implement a surveillance program to track mutations early enough to have real data about mutations of the virus. Only after the UK actually published mutations that increase the infection efficiency they woke up and are now, one year after the pandemic started, putting a surveillance program in place.

Bill Gates has predicted pandemics since a while talking about the Ebola or Saranpion example. We hear also about the Black Death & the Spanish grippe. He also warms of eventually worse pandemics as Covid. He suggests to get ready using technology and science. What is your take on this from your field and as a person? Can a pandemic kill the human race? Have we moved from war danger to biological pandemics? Can we get ready for worse scenarios? If, how? No, why not?

That is a tough one, not only Gates predicted the possibility of pandemics, this is actually a scenario that gets more and more likely these days, triggered by several facts: climate change, overpopulation and faster and more frequent travel. In addition more and more people deny vaccination which is a sever issue if it comes for example to measles or other already known infections, like most notable poliomyelitis, which has not yet been eradicated. Anti Vaxers actually ensure, that the risks for these known and avoidable diseases to break out again is growing. So it should be a moral duty to get vaccinated within a functioning society but this is no longer the case.

Here the society is to blame and not the individual as in the neo capitalistic stage of society most moral obligations are reduced to “me”, people care more for themselves instead of caring for the community which already lead to a global increase of outbreaks of preventable diseases.

The current pandemic is already very serious, but extinction of the human race is very unlikely. However, with two other crucial issues we increase the risk of outbreaks and pandemics and this is overpopulation and global warming. And this is a matter of fact that global warming increases risks directly as a recent outbreak of Anthrax showed.

Overpopulation leads to the needs of industrialized production of food where large scale animal farms pose a risk for zoonotic exchange between human and animal as it has been shown already several times. This zoonotic transfer can cause specific adaptions of viruses that has the potential of increased pathogenicity. Most notable example is the swine flu pandemic from 2009 which originated from pigs and transferred also to humans which is a characteristic for influenza transmitting between several species including birds, which are excellent vehicles for transportation.

Kate Jones, chair of ecology and biodiversity at University College London, says zoonotic diseases are increasingly linked to environmental change and human behaviour. The disruption of pristine forests driven by logging, mining, road building through remote places, rapid urbanisation and population growth is bringing people into closer contact with animal species they may never have been near before. The resulting transmission of disease from wildlife to humans, she says, is now "a hidden cost of human economic development". In a guest article published by IPBES, Peter Daszak and three co-chairs of the 2019 Global Assessment Report on Biodiversity and Ecosystem Services, Josef Settele, Sandra Díaz and Eduardo Brondizio, write that "rampant deforestation, uncontrolled expansion of agriculture, intensive farming, mining and infrastructure development, as well as the exploitation of wild species have created a 'perfect storm' for the spillover of diseases from wildlife to people."

An April 2020 study published in the Proceedings of the Royal Society Part B found that increased virus spillover events from animals to humans can be linked to biodiversity loss and environmental degradation, as humans further encroach on wildlands to engage in agriculture, hunting and resource extraction they become exposed to pathogens which normally would remain in these areas. Such spillover events have been tripling every decade since 1980. An August 2020 study published in Nature concludes that the anthropogenic destruction of ecosystems for the purpose of expanding agriculture and human settlements reduces biodiversity and allows for smaller animals such as bats and rats, who are more adaptable to human pressures and also carry the most zoonotic diseases, to proliferate. This in turn can result in

in more pandemics.

In October 2020, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services published its report on the 'era of pandemics' by 22 experts in a variety of fields, and concluded that anthropogenic destruction of biodiversity is paving the way to the pandemic era, and could result in as many as 850,000 viruses being transmitted from animals – in particular birds and mammals – to humans. The increased pressure on ecosystems is being driven by the "exponential rise" in consumption and trade of commodities such as meat, palm oil, and metals, largely facilitated by developed nations, and by a growing human population. According to Peter Daszak, the chair of the group who produced the report, "there is no great mystery about the cause of the Covid-19 pandemic, or of any modern pandemic. The same human activities that drive climate change and biodiversity loss also drive pandemic risk through their impacts on our environment."

The Wikipedia article also presents a comprehensive list of zoonotic transmitted diseases. The number of outbreaks, epi- and pandemics is definitely increasing over time.

https://www.nature.com/articles/s41598-020-72440-6

Permafrost dynamics and the risk of anthrax transmission: a modelling study

https://en.wikipedia.org/wiki/2009_swine_flu_pandemic

https://en.wikipedia.org/wiki/Zoonosis

Covid-19 is changing the world for the better and the worse. In your opinion what is the good, the bad and the ugly coming out of all this? Would a new type of empire or total surveillance set among us?

The world has changed for worse, there is nothing good in this. The rich parasites have even gained more and the poor have lost even if there was nothing more to loose. Although China went through the pandemic almost unharmed it is only the system that was not harmed and as any such system, they will never tell the truth, this is no a solution. If it comes to surveillance we are already controlled and manipulated by a few, that can even manipulate the so sacred things such as democracy. The type of surveillance we need is for the evolution of viruses so we might get a better warning about the next pandemic, which will be ignored and undermined as it happened already with “CoVid” to a certain extend. But economics and political image is more important than people dying, we have enough people so even a few million dead has no impact really, if it is poor and old people which have limited value for the rich. What we need is a pandemic, that preferably kills the rich to achieve a change for good.